PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 1121WOORD01	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP 03/09547	International filing date *(day/month/year)* 28.08.2003	Priority date *(day/month/year)* 29.08.2002

International Patent Classification (IPC) or both national classification and IPC
A61K31/473

Applicant
ALTANA PHARMA AG et al.

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
03.03.2004	29.03.2004

Name and mailing address of the international preliminary examining authority:

European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized Officer

Gavriliu, D

Telephone No. +49 89 2399-8274

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP 03/09547

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-62 as originally filed

Claims, Numbers

1-19 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 18-19

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the Standard.

☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-17
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-17
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-17
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

Claims 18-19 relate to subject-matter considered by this Authority to be covered by the provision of Rule 67.1(iv)PCT. Consequently, no opinion will be formulated with respect to the novelty, inventive step and industrial applicability of the subject-matter of this claims(article 34(4)(a)(i)PCT).

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. **Reference is made to the following documents**

D1: WO 02 05616 A (BYK GULDEN LOMBERG CHEM FAB ;GUTTERER BEATE (DE)) 24 January 2002 (2002-01-24)
D2: WO 99 05112 A (BYK GULDEN LOMBERG CHEM FAB ;GUTTERER BEATE (DE)) 4 February 1999 (1999-02-04)
D3: WO 99 57118 A (BYK GULDEN LOMBERG CHEM FAB ;FLOCKERZI DIETER (DE)) 11 November 1999 (1999-11-11)
D4: EP-A-0 490 823 (SANDOZ LTD ;SANDOZ AG (DE); SANDOZ AG (AT)) 17 June 1992 (1992-06-17)

2. **Novelty** (Article 33(1) and (2)PCT)

The subject-matter of the present application describes 3-hydroxy-6-phenylphenanthridines, useful as PDE-4 inhibitors.

D1 and D2 disclose 6-phenylphenanthridines differing from the present compounds through the R4 and R51 substituents which can be either hydrogen or C1-C4 alkyl and not oxygen as in the present application (see claim 1 of D1 and D2). D3 and D4 disclose compounds which have another core structure as the claimed compounds of the present invention. Consequently, the novelty of the present subject-matter is acknowledged.

3. **Inventive step** (Article 33(1) and (3)PCT)

The technical problem underlying the present invention is to be seen in the provision of further 6-phenylphenanthridines, useful as PDE-4 inhibitors for treating respiratory disorders and/or dermatoses.

D1, which is regarded as being the closest prior art, discloses compounds which differ from the present compounds through the substituents R3-R5, R31 and R51 which are either hydrogen or 1-4C alkyl (see claim 1) and not a hydroxy derivate as in the present application. The claimed compounds of D1 are also PDE-4 inhibitors.

D2 discloses PDE-4 inhibitors, which differ from the claimed compounds of the present invention either through the substituents R3-R5, R31 and R51, none of them being a hydroxy function, or through the substituent of the position 6 of phenanthridine ring, which is an alkylene or cycloalkylene moiety(see claim 1 of D2 and present application).

D3 and D4 describe PDE-4 inhibitors but with another core structure as the compounds disclosed by present application.

Since in D1, which discloses the closest structurally compounds of the claimed compounds, there is no indication that one of the substituents from the positions 1-4 of the phenanthridine ring could be a hydroxy moiety, an inventive step can be therefore acknowledged. Moreover the compounds disclosed by D2 have the same substituents in the position 1-4 of the phenanthridine ring as the compounds disclosed by D1, which appears to be an essential feature for phenanthridine derivatives with PDE-4 inhibitory activity.

4. **Industrial applicability** (Article 33(4)PCT).

For the assessment of the present claims 18-19 on the question whether they are industrial applicable, no unified criteria exist in the PCT Contracting States. The patentability can also be dependent upon the formulation of the claims. The EPO, for example does not recognize as industrially applicable the subject-matter of claims to the use of a compound in medical treatment, but may also allow,

however, claims to a known compound for the manufacture of a medicament for a new medical treatment.